

Partner 10

BATUMI SHOTA RUSTAVELI STATE UNIVERSITY (Georgia)

Brief description of partner university: *The history of LEPL-Batumi Shota Rustaveli State University takes its roots from 1935. In the building of the Boys' Gymnasium in 1935 a 2-year Teacher's Institute was opened with 4 faculties: Georgian Language and Literature, Physics-Mathematics, History and Natural Sciences-Geography. To this the faculty of Physical Education was added in 1936 and a faculty of Russian Language and Literature – in 1938. In 1938 the Institute was named after Shota Rustaveli.*

The University understands its special importance in the development of the region and considers as its priority the study of South-West Georgian culture and the Black Sea biology and ecology as well as phyto-pathological research and the development of agriculture and tourism.

LEPL-BSU is committed to the fundamental principles of the great Charter of European Universities, its main values are humanism, openness, accountability, support for the realization of personal potential, interdisciplinary and intercultural scientific research, dynamic development of teaching and management processes.

Today the University is considered one of the leading and traditional universities of the country that constantly strives to meet the demands of the country, society and the labor market;

BSU comprises 7 faculties: Faculty of Exact Sciences and Education; Faculty of Business and Economics; Faculty of Law and Social Sciences; Faculty of Natural Sciences and Health Care; Faculty of Humanities; Technological Faculty; Faculty of Tourism.

It also embraces the 3 Research Institutes: Niko Berdzenishvili Institute, Agrarian and Membrane Technologies Institute, Institute of Phytopathology and Biodiversity.

At present about 7 000 students study at the vocational, Bachelor, Master and Doctoral programs.

One of the top priorities of BSU is internationalization of education and research as well as establishment of high level standards; we value international cooperation, sharing experiences, implementation of the joint research and educational programmes; therefore, we give high importance and take care of every partner institution;

Even though the number of the students does not allow to claim that our university is a big institution in Georgia, in accordance with the amount of the ERASMUS+ projects and the exchange academic staff and the students BSU takes third place in the country.

GENERAL DESCRIPTION OF THE TRAINING MODULE

Level of study: Master's

Specialty: Physical Geography, Agroecology

Branch of knowledge: Physical Sciences, Agriculture

Title of Educational program: Geography, Agroecology-

Authors team:

1. Narguli Asanidze, Associate Professor.
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5. Khatuna Tchitchileishvili, PhD Student.

DESCRIPTION OF THE COURSE № 1

Applied Ecology

Number of ECTS credits: 10

Type of course: compulsory

Summary of the course: The given course provides MA students with in-depth knowledge on:

- Analysis of anthropogenic factor and its effects;
- Determine the causes and sources of negative changes in the environment based on the principles and laws of ecology;
- Search for the ways to prevent environmental changes and maintain the ecological balance and stable state of the environment;
- Harmonization of the relationship between the opportunities for rational use of natural resources, society and its subsistence environment.

Prerequisites for this course: Course “Sustainable systems and the environment”

Competences:

Knowledge and Understanding:

- Has a deep and systematic knowledge of the course, which allows to develop new, original ideas.
- Knows the analysis of the anthropogenic factor and the consequences of its impact, as well as the ways to avoid changes in the environment and maintain a stable condition.
- Understands the current problems in ecology and using the nature.

Learning outcomes:

- Able to act in a new, unforeseen and multidisciplinary environment; Search for new, original ways of solving complex problems, including conducting research independently using the latest methods and approaches.
- Able to analyze ecological data using modern information and communication technologies.

– Able to independently conduct research, analyze obtained materials and make presentations to the Professional society.

List of lecture topics:

1. Subject and tasks of ecology. Ecology levels; Biological systems. Sustainability of biological systems

2. Environment and its peculiarities; Ecological factors. Abiotic factors. Terrestrial environment. Soil cover. Aquatic environment, abiotic factors.

3. Organisms and the environment. General laws of adaptation to the environment. The law of the limiting factor. Law of Optimus. Organized biological systems. Populations.

4. Effects of aggregation and group. Polly principle: isolation and territoriality. Olimorphism.

Biocenoses and ecosystems. Food chains. Stratification of the structure of biocenoses. Pyramids of numbers.

5. Functioning of biosphere, Structure of biosphere. Terrestrial biomes. Marine biomes; Freshwater biomes. Peculiarities of anthropogenic impact on the environment.

6. Technogenesis; Demographic explosion; Anthropogenic change in the environment. The essence of anthropogenic pollution.

7. Distribution of anthropogenic waste. Causes of anthropogenic pollution. Chemicalization of agriculture; Ecologization of agriculture. Other causes of environmental pollution. Atmosphere and its pollution.

8. Hydrosphere and its pollution; Planet Biota; Toxic substances in food chains.

9. Technogenic pollution and human health; Global problems; Ozone sphere; Ozone holes; Acidic precipitation

10. Conservation of biodiversity. Anthropogenic erosion and desertification.

11. Overpopulation, mass poverty and the environment; The process of urbanization; Energy problems; Energy saving strategy.

12. Some results of anthropogenic impact on the environment in Georgia. Anthropogenic principles of environmental protection; Bioindication and bioassay.

13. Issues of conservative Biology Red books; protected territories; Ecological agriculture. Non-waste production. Community and Nature Relationship Strategy. Rome Club.

14. Ecological alternative and the concept of sustainable development; International organizations and events on environmental protection problems.

List of practical classes, including laboratories, studios and workshops:

1. The law of the limiting factor; superorganic biological systems.

2. Specifics of anthropogenic influence on the environment.

3. Issues of conservational biology, the Red Book, protected territories.

4. Waste-free production.

5. Energetic problems, energy saving strategies.

List of self-study topics:

1. Waste management as the global ecological problem and the problem of waste management in the region.

2. The Black Sea pollution and its influence on the sea biodiversity.
3. Anthropogenic principles of environmental protection, bioindication, biotesting.
4. Mass poverty and environmental ecological problem.

DESCRIPTION OF THE COURSE № 2

Remote Methods in Regional Geography and GIS Programmes

Number of ECTS credits: 5

Type of course: compulsory

Summary of the course: The goal of the geoinformation systems is to give the student wide knowledge on collection, storage and analysis of the GIS data as well as the types of GIS data and visualization; GIS idea, components and organization; on the practical importance of GIS mapping and data spatial analysis systems.

Prerequisites for this course: N/A.

Competences:

Knowledge and Understanding:

- Analyses the principles of construction of geoinformation systems;
- Explains the real computer picture of the specific geographic space.

Learning outcomes:

- Can find, store and analyze the information on the geographic space through utilization of various software.
- Can create the real computer-based picture of the specific geographic space through utilization of programming software and make thematic division into layers.
- Can use aerial decryption techniques and methods in geographical surveys of various subjects and scales.

List of lecture topics:

1. Geoinformation systems and remote sensing (definition of principles). Basics of building geoinformation systems (GIS).
2. Geoinformation systems and remote sensing (definition of principles). Basics of building geoinformation systems (GIS).
3. GIS and Maps. Methods of digital presentation of the data. Modeling of spatial data and methods of modeling.
4. Resources of data. Methods of creation and categorization of database.
5. Classification of geographical objects in GIS. Measurements on GIS maps.
6. Spatial data recording methods-Cadastral Method. The concept of databases.
7. From geoinformation system to geodatabase. Vector data visualization. Overview of different types of legends. Visual analysis of spatial data.
8. Work with captions and annotations, Capabilities for placing inscriptions. Adjust the visibility for the inscriptions.
9. Principles of construction of geoinformation systems; Types of databases.
10. GIS and maps: Methods of digital presentation of the information.

11. Standard methods for classifying cartographic data. Data connection: unification and relation.

12. Signs localized in the point, area and line.

13. Preparation of data presentation: Screen and Paper maps. Description of GIS created in Georgia.

14. Space photography of the Earth and features of space image. Aerial visual decoding.

List of practical classes, including laboratories, studios and workshops:

1. **Spatial data models, raster model,** vectoral model and GRID data presentation.

2. **Collection of data sources: cartographic source, topographic geodetic,** Satellite navigation systems, statistic data and global internet network.

3. Preparation presentation on data: screen and paper maps.

4. Description of the GIS-s created in Georgia.

5. 3D modeling through utilization of visual GIS modeling.

List of self-study topics:

1. Spatial data modeling and methods of modelling.

2. Data sources. Methods of data base creation and categorization.

3. Preparation of the presentation on the data” screen and paper maps.

Description of the GIS-s created in Georgia.

4. Space photography of the Earth and features of space images. Aerial visual decoding.

DESCRIPTION OF THE COURSE № 3

Climate and Global Processes

Number of ECTS credits: 10

Type of course: compulsory

Summary of the course: The given course provides MA students with in-depth knowledge on climate change under the circumstances of the global warming, i.e. on the complex processes in the atmosphere and their consequences. The MA programme students will get familiarized with the contemporary problems of the climate change, regularities of formation of global atmospheric processes and the results of the climate change in Georgia on the ground of the mentioned.

Prerequisites for this course: Course “Sustainable Systems and the Environment”.

Competences:

Knowledge and Understanding :

– Knows and understands the climate change problems linked to the global warming on the surface of the Earth and the expected outcomes.

Learning outcomes:

– Can define the main parameters (temperature, precipitation, humidity, wind, others) that determine the climate in the new, unforeseen and multidisciplinary environment, based on the gained knowledge, and use them in the practice.

– Responsibility and Autonomy: Based on the field research (observation of the meteorological elements) can determine how much the climate background varies by region and assess it.

– Can describe the cataclyms caused by the current climate change in nature through various methods of the field and modern communication technologies, make a conclusion based on the analysis, document and present it.

– Can determine the specifics of the learning process in relation with the global processes and the climate changes and enhance further knowledge.

List of lecture topics:

1. General references on the modern climate change. Major climate-producing processes.

2. Climate Radiation Factor. Sun– atmosphere – Earth energy system.

3. Circulation factor of climate. General circulation of the atmosphere and basic parameters.

4. The influence of oceans and continents on climate.

5. Impact of snow cover and ice cover on climate.

6. Impact of relief on climate.

7. Microclimate and local climate.

8. Changes of the climate of the past and the research methods; Rhythms of climate fluctuations and 1-year solar cycles.

9. Modern warming of the earth. Greenhouse effect, Jungle layer ozone hole nuclear winter.

10. Contemporary climate changes.

11. Hypothesis on the climate changes.

12. Climate resources and impact on the climate.

13. International monitoring on climate.

14. Contemporary climate of Georgia . Contemporary climate changes in Ajara.

List of practical classes, including laboratories, studios and workshops:

1. The influence of relief on the climate on the example of Georgia.

2. Discuss the climate change of the past and the research methods on the example of Europe and Asia.

3. Modern warming of the Earth. Hothouse effect. The Junge and the Ozone Layer (discuss the main problems and the causes).

4. Discuss the modern climate change on the example of Georgia.

List of self-study topics:

1. The influence on relief on the climate.

2. Climate change of the past and the research methods.

3. Modern warming of the earth. Hothouse effect; the Junge and the Ozone Layer; Nuclear Winter.

4. Contemporary climate of Georgia.